	Sanjay Ghodawat University, Kolhapur Established as State Private University under Govt. of Maharashtra. Act No XL, 2017	**2020-21** EXM/P/09/00

Year and Program: TY B Tech.	**School of Technology**	**Department: Mechanical Engineering**
Course Code: MET 308.2	**Course Title: Production and Operations Management**	**Semester : VI**
Day and Date: Thursday,10.06.2021	**End Semester Examination**	**Time:2 Hrs.** **Max Marks:50**

Instructions: 1) All Questions are compulsory.

Q.1	**Answer/Solve the following (any Two)**–	**Marks**	**Bloom's Level**	**CO**
a)	How do firms identify order winning and order qualifying attributes? State order winning and order qualifying attributes for the following. i. Hospital providing services to patients of Covid ii. An electric vehicle manufacturing unit	8	3	CO 308.2.1
b)	An Indian SME, designs, manufacturers and markets the pumps for customized applications and also makes to stock. The company currently is facing a lot of competition from both large indigenous and global manufacturers. The company's survival is at stake and has to take urgent strategic initiatives for survival and growth. i. What are the alternative strategic options available for the company? ii. Suggest suitable operations strategy with justifications.	8	3	CO 308.2.1
c)	Explain economic factors affecting the choice of process. An item which is required by the company can be manufactured on any of the three following machines. The fixed cost and variable cost for each of these machines are given in the table below.	8	3	CO 308.2.1

Machine	Fixed cost in ₹	Variable cost in ₹/unit
M_1	13,500	12.00
M_2	5,250	8.00
M_3	1,28,000	0.80

i. Suggest the best option if the requirement is 2,000 units and give decision rules.

ii. Suggest the best option if the requirement is 20,000 units and give decision rules.

Q.2 Answer/Solve the following (any two) –

a) An auto two-wheeler manufacturing company's sales figure of the previous financial year 20-21 for each month are given below. 8 3 CO 308.2.2

Month	Sales in units
Apr-20	8000
May-20	5000
Jun-20	9000
Jul-20	11000
Aug-20	13000
Sep-20	13000
Oct-20	10000
Nov-20	11000
Dec-20	14000
Jan-21	15000
Feb-21	16000
Mar-21	18000

i. Compute three months moving average for various months of the year and forecast for the month of April 21

ii. Compute three months weighted moving average for various months of the year using the following weights 0.45 for the immediate past, 0.30 for two periods before and 0.25 for three periods before and forecast for the month of April 21

iii. If MAD is the performance criterion, which forecasting method should be choose? Justify answer based on MAD calculation.

iv. Which other method of forecasting will you recommend for above application? Justify your answer.

b) Identify suitable aggregate production planning alternative for an organization manufacturing made-to-order items. Will you recommend change if the items are made-to-stock? Also, Comment on 'Mixed strategies are always superior to pure strategies in an aggregate production planning exercise.' 8 3 CO 308.2.3

c) A service provider has two stages in service delivery. Initially the customer arrives at stage I get the service and then reach the stage II where the remaining part of the service gets completed. All arriving customers wait at a lounge and are called on some basis into the system once a batch of eight accumulates. All of them go through these two stages, although the time they spent in these two stages may vary depending on their specific requirements. The time spent by a set of eight customers on these two stages are given below. | 8 | 3 | CO 308.2.3

	Customer number							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Stage I (minutes)	11	10	9	13	12	10	9	11
Stage II (minutes)	9	14	10	12	14	14	11	10
Arrival time (minutes)	0	1	3	4	5	7	8	10

i. Use Johnson's rule to schedule customers in the system
ii. Develop a Gantt chart for the schedule
iii. If you schedule the customers using FCFS, what is its impact on performance criterion? Use Gantt chart for comparing both the strategies.

Q.3 Answer/Solve the following (any two) –

a) Compare lean manufacturing with traditional manufacturing? How are different tools and techniques assist in developing the lean culture? | 9 | 2 | CO 308.2.4

b) What are the issues in implementation of JIT in Indian context? Suggest the remedial measures to overcome these issues for successful implementation of JIT. | 9 | 2 | CO 308.2.4

c) Explain the applications of following technologies of industry 4.0 in manufacturing organizations. Also mention the challenges associated with it. | 9 | 2 | CO 308.2.5
i. Internet of things
ii. Cloud computing
iii. Augmented reality

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